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10/568,804	02/06/2007	Hongguang Zhang	T2332-11218US01	7238

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MILES & STOCKBRIDGE PC  
1751 PINNACLE DRIVE  
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MCLEAN, VA 22102-3833

EXAMINER
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VELASQUEZ, VANESSA T

ART UNIT	PAPER NUMBER
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1793

NOTIFICATION DATE	DELIVERY MODE
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07/12/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/568,804	<b>Applicant(s)</b> ZHANG, HONGGUANG	
	<b>Examiner</b> Vanessa Velasquez	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-11,13,14,16-21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-11,13,14,16-21 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Claims***

Claims 3, 12, 15, 22, and 24 are canceled. Claims 1, 8, 9, 13, 14, and 23 are amended. Currently, claims 1, 2, 4-11, 13, 14, 16-21, and 23 are pending and presented for examination on the merits.

### ***Status of Previous Duplicate Claims Warning***

The previous duplicate claims warning of claims 12, 13, 22, and 23 is withdrawn in view of the amendments to the claims.

### ***Status of Previous Claim Objections***

The previous objections to claims 8, 9, and 13 are withdrawn in view of the amendments to the claims.

### ***Status of Previous Rejections Under 35 USC § 112***

The previous rejections of claims 1-11, 14-21, and 24 under the second paragraph of 35 U.S.C. 112 are withdrawn in view of the amendments to the claims.

### ***Duplicate Claims Warning***

1. Applicant is advised that should claim 13 be found allowable, claim 23 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two

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claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Objections***

2. Claim 14 is objected to because of a typographical error. “[M]ultivalent methal” should read “multivalent metal.” Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112, Second Paragraph***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4, 8-10, and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4 and 16 are dependent on canceled claims 3 and 15, respectively. Claims 8-10 are likewise rejected for being dependent on claim 4. For the purposes of examination, claims 4 and 16 will be interpreted as being dependent on claims 1 and 14, respectively. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 2, 4-7, 9, 10, 13, 14, 16-20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kandemir (GB 2 180 829 A) in view of Kenna (US 5,260,040).

Regarding claims 1, 4, 14, and 16, Kandemir teaches a method of extracting gold from ores, concentrates, and tailings by subjecting gold-containing substrate to a leach medium (page 1, lines 5-7, 54-59). The leach medium contains a sulphide-oxidizing bacteria (oxidant) along with one or more of the following chemical reagents: thiourea, chlorine, hypochlorite, chloride, thiosulphate, and thiocyanate (page 2, lines 46-55; page 3, lines 14-15; page 11, lines 32-33, 49-51). The gold is recovered (page 3, lines 53-56). It is noted that the oxidizing bacteria oxidize the auriferous sulphide, not the thiosulphate (page 1, lines 54-59).

Kandemir does not teach the presence of ethylenediaminetetraacetate (EDTA) in the leach solution. Kenna teaches the addition of ethylene diamene tetra acetic acid (EDTA) and salts of EDTA (a salt of acetic acid is acetate) to a thiourea leach solution for leaching gold from gold-bearing materials (abstract). Ferric ions oxidize and permanently decompose thiourea, which plays a critical role in the extraction of gold (Kenna, col. 1, lines 40-58; col. 2, lines 9-23). When EDTA and salts thereof are added, they form complexes with ferric ions (EDTA-iron complexes), preventing decomposition of the thiourea (Kenna, col. 2, lines 9-23). It is noted that Kandemir encounters the same problem of the decomposition of thiourea into formamidine disulfide and sulfur by the presence of ferric ion (multivalent metal) that forms from bacterial oxidation (page 3,

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lines 15-21). Therefore, it would have been obvious to one of ordinary skill in the art to have added EDTA salts of Kenna to the leach solution of Kandemir for the purpose of reducing the occurrences of the decomposition of thiourea into products such as sulfur, which would lessen the effectiveness of thiourea as a leaching fluid.

Regarding claims 2 and 19, Kandemir teaches that the thiourea may have a concentration of 0.1-5.0 grams per liter of leach solution (0.001314-0.06569 mole/L) (page 6, lines 49-51), which overlaps the claimed range. The overlap between the ranges in the prior art and recited in the claims creates a *prima facie* case of obviousness because it would have been obvious for one of ordinary skill in the art to have optimized within a range already known in the art (MPEP § 2144.05).

Regarding claims 5 and 6, Kandemir teaches that the thiosulphate may be in the form of sodium thiosulphate (page 2, lines 53-55).

Regarding claims 7 and 18, Kandemir teaches that the chemical reagent (i.e., any one or combination of thiourea, chlorine, hypochlorite, chloride, thiosulphate, and thiocyanate) may be in proportion of 0.5-35% w/v (weight or mass per unit volume) (page 6, lines 32-36). In the instance the chemical reagent is sodium thiosulphate (molecular weight: 158.11) and the unit volume is a liter, the concentration of sodium thiosulphate would be 0.003162-0.2213 mole/liter, which overlaps the claimed range.

Further regarding claims 4 and 9, the EDTA salts may be prepared before addition to the leach solution or added directly to the solution (Kenna, col. 3, lines 46-51). Kenna teaches that EDTA salts are suitable for the process therein (Table 1).

Regarding claims 10 and 17, the ferric ion-EDTA complex is at least 0.0025-0.1 M (mole/L) (Kenna, Table 2, "Fe"), which overlaps the claimed range. Since EDTA forms a complex with at least one ferric ion, the ferric ion-EDTA complex concentration must be at least the concentration of ferric ion to which it bonds.

Regarding claims 13 and 23, the claim recites that thiourea or a thio-substituted organic compound is present in the leach solution. Kandemir teaches that thiourea may be present in the leach solution (page 2, lines 46-55), thereby satisfying the claim. Kandemir also teaches that formamidine disulphide may be present in the leach solution (page 6, lines 49-56).

Regarding claim 20, the gold may be recovered by cementation (Kandemir, page 2, lines 1-5).

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kandemir (GB 2 180 829 A) in view of Kenna (US 5,260,040), as applied to claim 4 above, and further in view of *Hawley's Condensed Chemical Dictionary*.

Regarding claim 8, Kandemir in view of Kenna teach that the EDTA salts may be prepared before addition to the leach solution or added directly to the solution (Kenna, col. 3, lines 46-51). Kenna teaches that EDTA salts are suitable for the process therein (Table 1). Kandemir in view of Kenna do not teach the specific FeEDTA complex to be prepared prior to addition to the leach solution. However, those of ordinary skill in the art would understand that EDTA salts encompass those that include ferrous EDTA salt complexes, as evidenced by *Hawley's Condensed Chemical Dictionary* (definition of

“ethylenediamenetetraacetic acid”). *Hawley's Condensed Chemical Dictionary* teach various metal chelating agents that exist in their salt complex forms before addition to a reaction bath (definition of “ethylenediamenetetraacetic acid”; “Use” section).

4. Claims 1, 2, 4-7, 9-11, 13, 14, 16-21, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. (US 5,785,736) in view of Kenna (US 5,260,040).

Regarding claims 1 and 14, Thomas et al. teach a process for extracting gold from ore slurry (abstract). The leaching solution contains a thiosulfate and copper ions (oxidant) (Thomas et al., col. 9, lines 1-14, 28-32). The copper ions oxidize gold, not the thiosulphate (Thomas et al., col. 9, lines 28-32). Thomas et al. do not teach the presence of thiourea. Kenna, drawn to a method of extracting gold from gold-bearing material, teaches that thiourea is a suitable leaching fluid for recovering gold (col. 1, lines 29-37). It has been held that “[i]t is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art” (*In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted)). Thus, in the present case, it would have been obvious to one of ordinary skill in the art to have added thiourea, as disclosed by Kenna, to the thiosulfate leaching solution of Thomas et al. because of their recognized status in the art as being equivalents (MPEP § 2144.06).



Kenna teaches the addition of ethylene diamene tetra acetic acid (EDTA) and salts of EDTA (a salt of acetic acid is acetate) to a thiourea leach solution for leaching gold from gold-bearing materials (abstract). Ferric ions oxidize and permanently decompose thiourea, which plays a critical role in the extraction of gold (Kenna, col. 1, lines 40-58; col. 2, lines 9-23). When EDTA and salts thereof are added, they form complexes with ferric ions (EDTA-iron complexes), preventing decomposition of the thiourea (Kenna, col. 2, lines 9-23). It is noted that Thomas et al. would encounter the same problem of the decomposition of thiourea into formamidine disulfide and sulfur by the presence of ferric ion (multivalent metal) that forms from decomposition of iron sulfides found in many gold-bearing ores (col. 7, lines 29-38). Therefore, it furthermore would have been obvious to one of ordinary skill in the art to have added EDTA salts of Kenna to the leach solution of Kandemir for the purpose of reducing the occurrences of the decomposition of thiourea into products such as sulfur, which would lessen the effectiveness of thiourea as a leaching fluid.

Regarding claims 2 and 19, the thiourea concentration is 0.005-0.4 M (mole/L) (Kenna, Table 2), which overlaps the claimed range. The overlap between the ranges of the prior art and those recited in the claims creates a *prima facie* case of obviousness because it would have been obvious for one of ordinary skill in the art to have optimized within a range already known in the art (MPEP § 2144.05).

Regarding claims 4, 9, and 16, the EDTA salts may be prepared before addition to the leach solution or added directly to the solution (Kenna, col. 3, lines 46-51). Kenna teaches that EDTA salts are suitable for the process therein (Table 1).

Regarding claims 5-7 and 18, the thiosulfate may be sodium thiosulfate with a concentration of 0.01-0.1 M (mole/L) (Thomas et al., col. 8, lines 64-67 to col. 9, lines 1-6), which overlaps the claimed range.

Regarding claims 10 and 17, the ferric ion-EDTA complex is at least 0.0025-0.1 M (mole/L) (Kenna, Table 2, "Fe"), which overlaps the claimed range. Since EDTA forms a complex with at least one ferric ion, the ferric ion-EDTA complex concentration must be at least the concentration of ferric ion to which it bonds.

Regarding claims 11 and 21, the pH of the leaching fluids during leaching is 7-8.7 (Thomas et al., col. 10, lines 7-10), which overlaps the claimed range.

Regarding claims 13 and 23, the claim recites that thiourea or a thio-substituted organic compound is present in the leach solution. Kenna teaches the presence of thiourea in leaching solution (abstract), which satisfies the claim limitation of thiourea.

Regarding claim 20, the gold may be recovered by cementation procedures (Thomas et al., col. 12, lines 66-67 to col. 13, lines 1-8).

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. (US 5,785,736) in view of Kenna (US 5,260,040), as applied to claim 4 above, and further in view of *Hawley's Condensed Chemical Dictionary*.

Regarding claim 8, Thomas et al. in view of Kenna teach that the EDTA salts may be prepared before addition to the leach solution or added directly to the solution (Kenna, col. 3, lines 46-51). Kenna teaches that EDTA salts are suitable for the process therein (Table 1). Thomas et al. in view of Kenna do not teach the specific

FeEDTA complex to be prepared prior to addition to the leach solution. However, those of ordinary skill in the art would understand that EDTA salts encompass those that include ferrous EDTA salt complexes, as evidenced by *Hawley's Condensed Chemical Dictionary* (definition of "ethylenediaminetetraacetic acid"). *Hawley's Condensed Chemical Dictionary* teach various metal chelating agents that exist in their salt complex forms before addition to a reaction bath (definition of "ethylenediaminetetraacetic acid"; "Use" section).

### ***Response to Arguments***

6. Applicant's arguments filed 4/12/2010 have been fully considered but they are not persuasive.

First, Applicant argues that the present invention is not *prima facie* obvious over Kandemir because Kandemir relies on a bacterial oxidant, whereas the present invention does not rely on bacteria, but rather, EDTA complex. In response, Applicant's argument is not persuasive because it is not commensurate in scope with the claimed invention. The claims utilize the transition phrase "characterised by," which is open language. It does not exclude the presence of other additional steps and/or components not explicitly recited in the claim. See MPEP § 2111.03. Therefore, Kandemir is properly applied because the claims do not preclude the presence of bacterial oxidant in the invention.

Second, Applicant argues that the claimed invention is patentably distinct over Kandemir because the present application relies on thiosulfate as the lixiviant, as

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opposed to thiourea. In response to Applicant's argument that the references fail to show certain features of Applicant's invention, it is noted that the features upon which applicant relies (i.e., thiosulfate as lixiviant) are not recited in the rejected claims.

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See MPEP § 2106(II)(C). See also *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Third, Applicant argues that Kandemir does not specifically teach the combination of thiosulfate with thiourea. In response, Kandemir teaches that thiourea, chlorine, hypochlorite, chloride, thiosulphate, thiocyanate, or a combination of these reagents may be utilized (page 2, lines 46-55; page 3, lines 14-15; page 11, lines 32-33, 49-51). This would reasonably suggest to a person of ordinary skill in the art that a combination any one of the reagents, alone or in groups of two or more, can be implemented as the reagent. Therefore, the combination of at least thiourea with at least one other reagent is disclosed.

Fourth, Applicant argues that one of ordinary skill in the art would not combine the features of Kenna with Kandemir because Kandemir refers to an indirect bacterial leach. In response to Applicant's argument that Kenna is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Kenna is particularly relevant to a problem identified by Kandemir. Kandemir discloses

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the problem of the decomposition of thiourea into formamidine disulfide and sulfur by the presence of ferric ion (multivalent metal) that forms from bacterial oxidation (page 3, lines 15-21). Kenna provides a potential solution by adding EDTA salts, as Kenna teaches that when EDTA and salts thereof are added, they form complexes with ferric ions (EDTA-iron complexes), preventing decomposition of the thiourea (Kenna, col. 2, lines 9-23). Therefore, it would have been obvious to one of ordinary skill in the art to have added EDTA salts of Kenna to the leach solution of Kandemir for the purpose of reducing the occurrences of the decomposition of thiourea into products such as sulfur, which would lessen the effectiveness of thiourea as a leaching fluid.

Fifth, Applicant argues that one of ordinary skill in the art would not utilize thiourea in the process of Thomas et al. because thiourea should not be used at pH greater than 4, whereas the system of Thomas et al. is run at a higher pH. In response, Thomas et al. teach that the process described therein may be run at pH between 6 and 8 (col. 3, lines 29-33). Kenna defines acidic solution as solutions having a pH of less than 7 (col. 3, lines 46-61), which overlaps the pH level of Thomas et al. Therefore, by the definition set by Kenna whose process includes the use of thiourea, the process of Thomas et al. would provide sufficient acidity for the thiourea to function.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Velasquez whose telephone number is 571-270-3587. The examiner can normally be reached on Monday-Friday 9:00 AM-6:00 PM ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached at 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/  
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/Vanessa Velasquez/  
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